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The Labrid Fishes of the Subgenus **JULIS** Cuvier, 1814

(In **CORIS** Lacepede, 1802)

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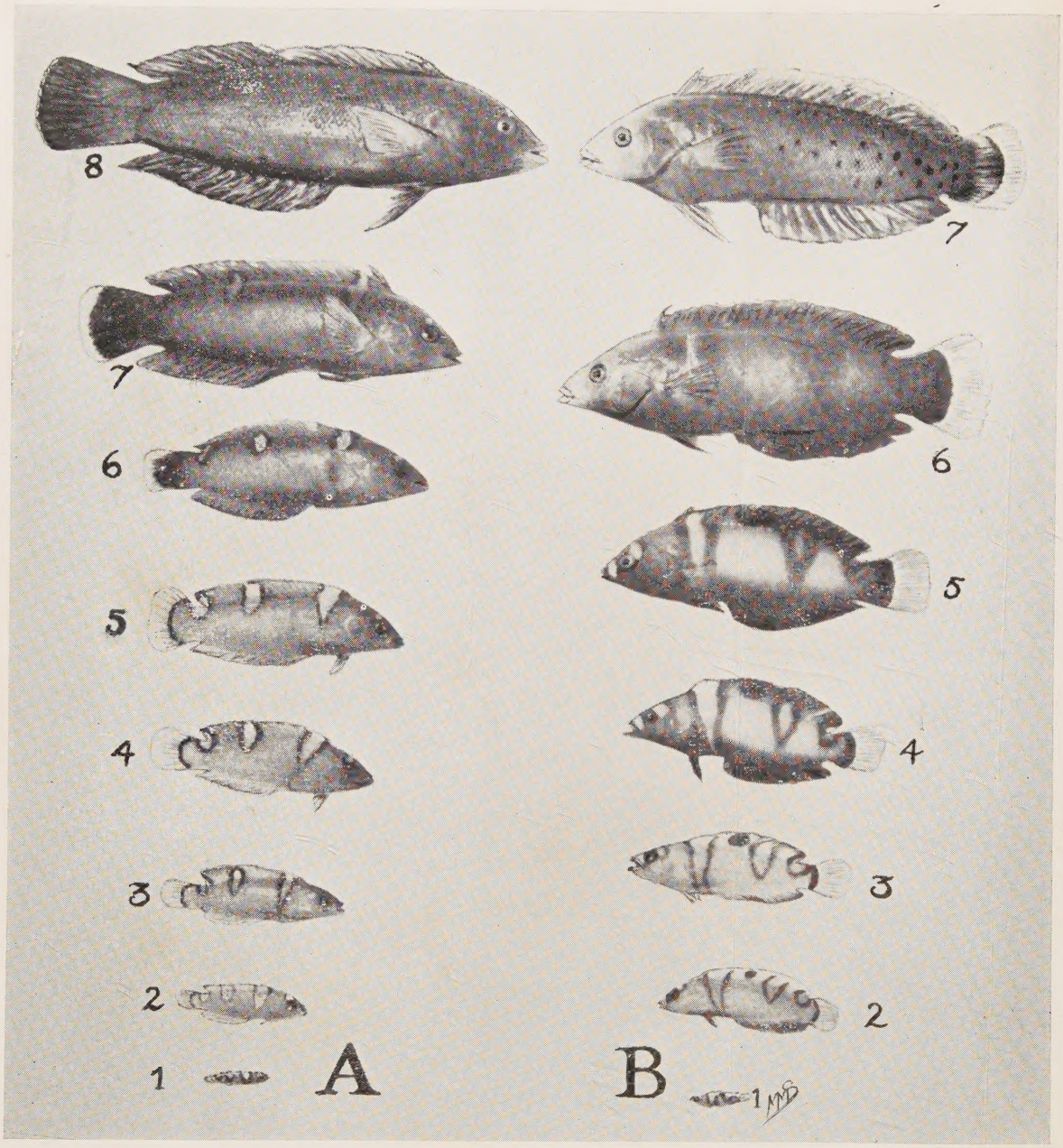

PLATE I

A. **Coris gaimard africana n. subsp.** 1. 17 mm. (In). 2. 33 mm. (Mal). 3. 48 mm. (Sh). 4. 55 mm. (B.P.). 5. 68 mm. (Mal). 6. 73 mm. (Sh). 7. 102 mm. (Sh). 8. 132 mm. (Mal).

B. **Coris formosa** (Bennett). 1. 16 mm. (Baz). 2. 48 mm. (Seychelles). 3, 56 mm. (Baz). 4. 68 mm. (B.P.). 5. 85 mm. (Ibo). 6. 112 mm. (Mal). 7. 118 mm. (Sh).

Baz, Bazaruto: B.P., Baixo Pinda: Ibo: In, Inhaca: (all in Mozambique). Mal, Malindi and Sh, Shimoni, (Kenya).

The Labrid Fishes of the Subgenus **JULIS** Cuvier, 1814 (in **CORIS** Lacepede, 1802) from South and East Africa.

(with Plates I & 2)

by J. L. B. SMITH,

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Rhodes University, Grahamstown.

FAMILY LABRIDAE

Fishes of the genus **Coris** Lacepede, 1802 which occur in warm waters of all oceans are a well defined group, characterised as follows: fairly slender fusiform body with rather sharp snout, forehead slightly more prominent with age. Scales small, head and fins naked. Lateral line continuous, with distinct abrupt bend posteriorly. A single series of pointed teeth in the jaws, 2-4 prominent curved canines in front, often a canine in angle. Gill-rakers few, short. Two flexible anterior dorsal spines often form a crest, the first longest. Probably less than a dozen species in the Indo-Pacific, the type species, **angulata** Lacepede, 1802 grows to a large size.

Various subgenera have been proposed, among other features the absence of a canine in the angle of the mouth in the type species has been used to justify this, while the genus **Julis** Cuvier, 1814, generally assigned only sub-generic rank, covers a fairly well defined group with distinctly smaller scales. In this latter group the following Indo-Pacific species have been proposed: (1) **gaimard** Quoy & Gaimard, 1824, Hawaii. (2) **greenovii** Bennett, 1829, W.Pacific. (3) **formosa** Bennett, 1834, Ceylon. (4) **pulcherrima** Gunther, 1862, East Indies. (5) **frerei** Gunther, 1866, Zanzibar.

Although not rare, these fishes are nowhere abundant, and as colours fade rapidly, not many reliable illustrations in colour are available.

Several recent workers have considered **formosa** Bennett, and **pulcherrima** Gunther, to be identical with **gaimard** Q & G. There has been no further record of **frerei** Gunther.

In our work of recent years in South and East Africa, we found all the species listed above except none that we could distinguish as **pulcherrima** Gunther. In this group pattern and colour are of first importance in differentiation, and investigation has shown that 3 existing species merit recognition, viz: **gaimard** Q & G; **formosa** Bennett, and **frerei** Gunther. The Western Indian Ocean fish hitherto identified as **gaimard** differs from the typical Pacific form in constantly having a spotted dark coloured caudal. The two are otherwise so closely allied that I hesitate to separate them by full specific rank, and they are described as geographical subspecies, **gaimard gaimard** Q & G, of the Pacific, and **gaimard africana n. subsp.** from the Indian Ocean.

In so far as may be determined the maintenance of **pulcherrima** Gunther, as distinct from **gaimard** Q & G, does not appear justifiable. Dr. E. Trewavas of the British Museum, who has kindly examined Gunther's type of **pulcherrima,** reports that it agrees exactly with Jordan and Evermann's 1905 illustration (**loc. cit.** below, Pl XXVII). The case of **greenovii** Bennett, a strikingly marked small Western Pacific species, is interesting. We had long since discovered in East Africa a fish we identified as **greenovii** Bennett, but had observed that with growth it appeared to grade into the form we regarded as **gaimard** Q & G. In order to establish this we hunted **"greenovii",** finding these fishes rare but widespread throughout East Africa. In the form first noticed the body colour is orange yellow, the light mark on the nose does not extend laterally, in all but the tiniest fishes the dark margins of the anterior large "V" meet ventrally, and there is no black ocellus on the dorsal fin. We also discovered in East Africa another species of **"greenovii",** comparable but distinct, in which the white mark on the nose extends as a saddle on each side, the dark margins of the light areas are markedly broader than in **"greenovii"** Bennett, those on the anterior "V" never meet ventrally, while from the earliest stadia there is a pronounced black ocellus on the middle of the dorsal fin. (This ocellus is visible as a black speck even in a 16 mm. fish, Plate I, B.1). We have a fine series which shows the **"greenovii"** Bennett form of East Africa to be the young of **gaimard africana n. subsp.** (Plate I, A), while those with the dorsal ocellus grade into **formosa** Bennett (Plate I, B). These series clearly establish the validity of **formosa** Bennett, as distinct from **gaimard** Q & G.

In **gaimard africana** with growth the light areas shrink dorsally, the general colour changes gradually from immaculate brilliant orange yellow to brick red, the tail develops fine blue spots that later become green, most of head and caudal darken. In **formosa** the dark margins to the light areas increase with growth and eventually merge with the rest. At stage B 6 (Plate I) the light areas show only faintly between the diffused dark borders, several of the large dark spots characteristic of **formosa** have formed on the peduncle, on the dorsal and above the anal, from then on they become more distinct, spreading over body and vertical fins. In all stages the head of **formosa** is distinctly lighter than the body, and the hind part of the caudal abruptly lighter than the basal part.

The **"greenovii"** young of both East African species are beautiful objects in life, of many specimens all were brilliant orange or yellow, with darkedged white zones. At rest on the bottom they exactly resemble fragments of shell and are difficult to recognise as fishes except at close range. Bleeker's artist (At.Ich.1862, I, Pl XXXI, fig. 2) must have had a long dead specimen of **greenovii,** for the drab colours shown are very different from those of East African fishes. (See Smith, 1953, Sea Fish.S.A., Pl 107, fig 809).

Full colour descriptions of the species of this group are not given here, they will be illustrated in life colours in a treatise on the fishes of the Western Indian Ocean now in preparation. Despite minor variations in general pattern of body and fins each species shows an almost constant characteristic pattern on the head, which may sometimes be observed complete even in preserved fishes. Typical markings are described and figured as they are an important aid in diagnosis.

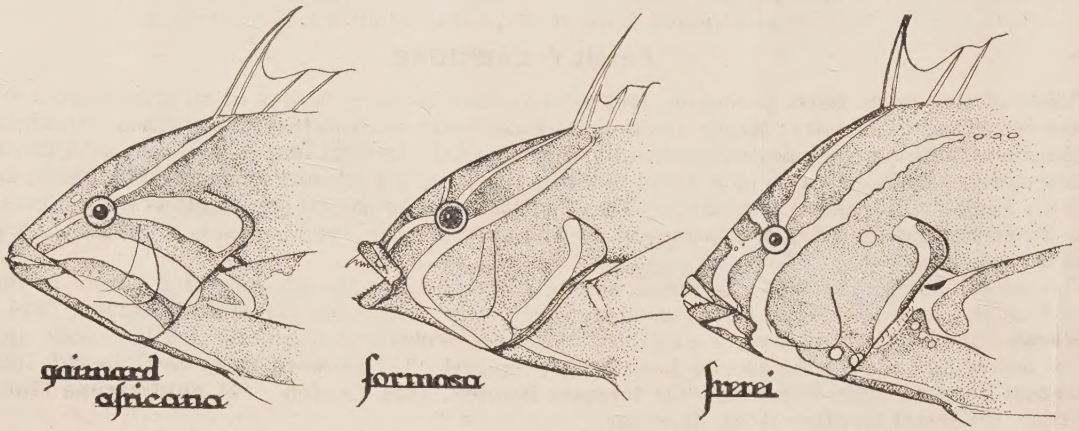

Fig. 1. To show typical head patterns of **Coris** species. Light areas are blue or green in life. Taken from specimens shown in Pl II.

Using poison, we took the three species in many parts of the Western Indian Ocean, mostly in rather deep weedy tide pools. Smaller specimens were seen to emerge from the sand.

KEY TO SPECIES

A. Two distinct wavy subhorizontal green bars on head over operculum. No large dark spots or dark crossbars on hind part of body. Often a single light zone across body behind pectoral. ..... **gaimard**

I. Caudal light, yellow, immaculate, uniform or narrow hind margin orange. Rounded small blue ocelli on hind part of body. (Pacific). ..... **gaimard gaimard**

II. Caudal dark, with small green spots, sometimes a greenish zone centrally, narrow light hind margin. Small spots on hind part of body green in adults. (W. Indian Ocean). ..... **gaimard africana n. subsp.**

B. No wavy bars over operculum.

I. Dark spots on body and vertical fins. Caudal sharply tricoloured, broad hind portion light. Bar on head from behind eye runs to base of dorsal. Head contrasted lighter. ..... **formosa**

II. Body with 8-12 distinct dark cross bars. Caudal dark with narrow red hind margin. Bar on head from behind eye ends on front part of lateral line. ..... **frerei**

Coris gaimard (Quoy & Gaimard), 1824
Coris gaimard gaimard Q & G.

Julis gaimard Quoy & Gaimard, Voy.Uranie Zool. 1824, 265, Pl 54, fig 1 (Hawaii).
?**Coris gaimard** Bleeker, Atl.Ich. 1862, I, Pl 19, fig 2 (Celebes).
Julis greenovii Bennett, Zool.Journ. 1829, IV, 37 (Sandwich Is.). Jordan & Evermann, Fishes Hawaii, 1905, 308, Pl XXX.
Coris greenoughi Bleeker, At.Ich. 1862, I, 100, Pl XXXI, fig 2 (Celebes).
Coris pulcherrima Gunther, Cat.Fish.B.M. 1862, IV, 200 (Amboyna). Gunther, Fische Sudsee, 1909, V, 278 (W. Pacific). Jordan & Evermann, Bull.U.S.Fish.Comm. 1905, XXIII, 305, Pl XXVII (Hawaii).
?**Coris formosa, (non** Bennett) Bleeker, At.Ich. 1862, I, Pl 19, fig 3 (Amboyna).
Coris gaimard, Book of Fishes, Nat.Geog.Soc. 1952, 253, Pl.

The adult of this species is well characterised by illustrations in colour, three noted above, the original of Quoy & Gaimard, 1824; that of Jordan and Evermann, 1905; and an excellent colour photograph in the Book of Fishes of the National Geographic Society. All of these agree reasonably well and show the

characteristic green bands on the head (exactly or almost exactly as in **africana n. subsp.**), an immaculate yellow caudal fin, numerous blue spots on the body, and the dorsal fin red. Quoy & Gaimard's illustration was likely based on a somewhat faded specimen. Hiyama (Poisonous Fishes Japan, 1943, Pl 13, fig 37) shows **gaimard** Q & G, with typical green bars on head, the body greenish brown, each scale with a blue green spot, caudal with brown basal area bordered distally blue, distal 2/3 of caudal clear yellow, the margin orange. I cannot read the text, but suspect this painting to be a composite rather than from life. Gunther (Fische Sudsee, V, 1909, 277-8) records both **gaimard** and **pulcherrima** from a wide area, including the "Indian Archipelago", but does not clearly distinguish between the two forms, stating both to have a clear yellow caudal. Bleeker's illustrations (**loci. cit.** 1862, above) were clearly made from faded specimens. Both appear to have been **gaimard gaimard** Q & G.

Among numerous specimens from East Africa, ranging to 365 mm. in length, previously regarded as **gaimard** Q & G, we have never seen one with a light caudal, nor does there appear to be any certain record of this form from the Indian Ocean. **C. gaimard gaimard** Q & G, as here defined appears to be confined to the Pacific. Both Bleeker's illustration (**loc. cit.** above, 1862) and that of Jordan & Evermann (**loc. cit.** above. 1905) of **greenovii** agree more closely with the East African specimens of that stage of **gaimard africana** than with those of **formosa** Bennett. I have a specimen almost the exact size of that shown by Jordan & Evermann and there are differences: in the E. African fish there is only a small dark area on the hindmost dorsal rays, no diffused dark blotch on the peduncle, while the caudal in my fish is almost wholly dark (See Pl I, A, fig 7). There is apparently a significant difference in marking between the Pacific and the African specimens of **gaimard** Q & G even in the early stages.

Coris gaimard africana n. subsp.

(Pls I & II)

Coris gaimard Smith, Sea Fish.S.A. 1949, 292, Pl 58, fig 809 (Lower).

As indicated above, this form has previously been identified with **gaimard** Quoy & Gaimard, 1824, to which it is closely related, indeed were both found together they might well be accepted as colour variants. As far as can be ascertained there seems to be complete geographical cleavage between the two forms, for **gaimard gaimard** as here defined does not seem to have been found outside the Pacific, and the present form is not certainly known east of Seychelles, though it may extend there.

D IX 12. A III 12. P ii 11. Scales 77-80 series, 36 from anal origin up and back. Scales on head to above middle of eye, midline of nape narrowly naked. 6+1+10-11 short gillrakers. First dorsal spine filamentous with age. Adults are in life dull brick red to purplish brown, with small bright green spots (blue in small specimens) on hinder part of body and on caudal. On head a narrow green stripe from mid maxilla to eye, then from eye above to second dorsal spine. A subhorizontal wavy broad green stripe from behind eye across opercle, another below from angle of mouth to near pectoral base. A green stripe each side of chin and throat to pelvic. Sometimes a vague light green vertical bar or zone across body behind pectoral, still visible as a light area in some preserved specimens. Front dorsal spines purple brown, basal 2/3 of whole fin body colour to reddish purple, this area margined above by a green line, above this brown, with a row of blue spots, edge narrowly blue, green spots on hind half of soft dorsal. Anal similar, purplish brown with line of green spots, basally a greenish longitudinal bar or streaks distally margined with blue, above this purplish brown, edge of fin narrowly blue. Pectoral basally purplish to red, distal 2/3 green, a brilliant green spot in axil. Pelvic spine blue, rays green, membrane purple brown. Caudal mostly dark, body colour, larger specimens with a median dull green area across distal third, whole fin with fine bright green spots, narrow hind margin white, light green or yellow (colourless when preserved). Iris yellow, with vermilion ring round pupil. In half grown specimens front and top of snout to commencement of scaling light, but darken with age.

Numerous specimens, 17-365 mm. in length, including the **"greenovii"** stages, taken from 30°S in South Africa northwards throughout the Western Indian Ocean to Seychelles. **africana** does not appear to be anywhere as abundant as **formosa** Bennett. The type, 300 mm. in length, from Mahe, Seychelles, in this Department. As far as is known this form is confined to the Western Indian Ocean.

Coris formosa (Bennett), 1834

(Plates I & II)

Labrus formosus Bennett, Fishes Ceylon, 1834, Pl 16.

Coris gaimard (**non** Q & G), Smith, Sea Fish. S.A. 1949, 292, Pl 58, fig 809 (middle). **ibid,** 1953, (3rd edition), Pl 107, fig 809 (juvenile).

Coris formosa, Day, Fish. India, 1876, 407, Pl 86, fig 5 (Malaya). Gunther, Fish Zanz., 1866, 100.

This is the most abundant species of this group in the Western Indian Ocean, attaining at least 450 mm. Previously known only from Ceylon, Zanzibar and Malay archipelago, we have specimens 16-380 mm. from Durban northwards to Malindi (3°S), at Zanzibar, Pemba, Aldabra and Seychelles.

D IX 12. A III 12. Scales 77-80 series, 36-38 from anal origin up and back. Scales on head to above middle of eye, midline of nape narrowly naked. 6+1+9-10 short gillrakers. First dorsal spine filamentous with age. The **"greenovii"** juveniles are brilliant orange with dark edged white areas and a prominent ovoid black ocellus on the dorsal fin (Plate I, series B).

Adults are in life dark green, darker posteriorly, grading to pale yellow on head, most of which is generally lighter than body. Body behind pectoral with conspicuous black spots, some on base of soft dorsal, anal and caudal. Red-margined pale blue to green bands on head as shown in Fig 1, the bar behind eye always runs to base of front dorsal spines. 1-2 bars across interorbital and a median stripe predorsal develop with age as head darkens. Caudal always conspicuously tri-coloured, basally dark green to purple, with black spots, medially a red cross bar, hind two-fifths white to pale pink. All but the largest have a conspicuously light head, by which in the water they may be recognised at once, especially from above.

I can find no evidence that this fish occurs outside the Indian Ocean. Day apparently never saw a specimen from Indian seas, his colour notes are compiled, the specimen illustrated came from "Malay Archipelago", the most easterly record for this species.

Coris frerei Gunther, 1866

(Plate II, C)

Fishes of Zanzibar, 1866, 101, Pl XIII.

This species was previously known only from the type, 508 mm. in length, from Zanzibar. It is now recorded from northern Mozambique, Tanganyika, Pemba, Kenya, Aldabra and Seychelles, rather rare, attains at least 600 mm. We have seen none smaller than 300 mm.

D IX 12. A III 12. Scales in 73-75 series, 34-35 from anal origin up and back. Scales on head to above middle of eye, midline of nape narrowly naked. 6+1+9-10 short gillrakers. 1st dorsal spine filamentous with age. Body deeper than preceding species.

Adults in life are brickred or brownviolet, grading down to yellow on lower half of head, on throat and belly to anal origin. Most of body with minute brilliant blue and emerald green spots. On body between head and caudal are 8-10 uniform dark purple cross bars, about equal interspaces which are mauve-pink. Background of head, chest and body to first cross bar pinky gold. Top of head deep jade, subparallel pair of emerald green bars edged blue almost enclose eye, the anterior above to base of dorsal, below to maxilla, where it bends back to angle of mouth : the posterior bar ends above on lateral line, below runs from eye down over preorbital and curves back to throat and pelvic origin. 1-2 bars across interorbital. A broad emerald green band edged mauve round hind margin of opercle, bordered blue anteriorly (See Fig 1). Caudal dark blue, with small blue spots, edge plain, orange or red. Pectoral in brilliant emerald green blotch on body.

This species is apparently confined to the Western Indian Ocean. It might be suspected that **formosa** and **frerei** could be sexual dimorphs, but I find ripe females in both these forms, and have little doubt that **frerei** is a valid species.

I wish to express my gratitude to the South African Council for Scientific and Industrial Research for financial support, and to the authorities of Mozambique, Tanganyika, Kenya and Seychelles for valued assistance.

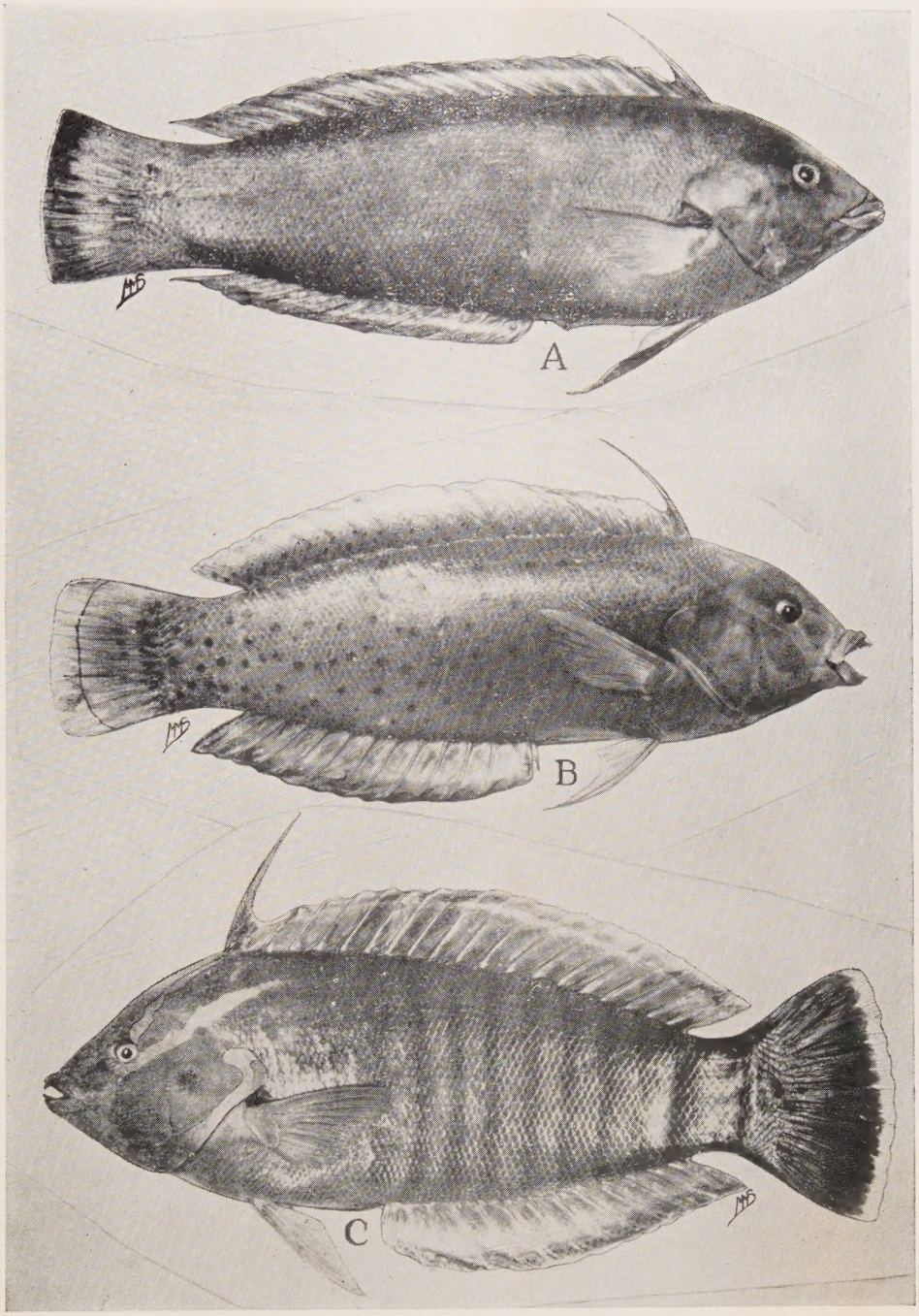

PLATE II

A. **Coris gaimard africana n. subsp.** Type, 300 mm. B. **Coris formosa** (Bennett). 290 mm.
C. **Coris frerei** Gunther, 380 mm.